

THE

Soybean Digest



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OF

THE AMERICAN SOYBEAN ASSOCIATION

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THREE-ROLLER LABORATORY PAINT MILL GRINDING PIGMENTS IN SOYBEAN OIL

U. S. D. A. PHOTOGRAPH BY PETER KILLIAN

● Scientists of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, seek practical ways to widen the use of the soybean, now an important crop of the United States. At the Regional Soybean Industrial Products Laboratory, Urbana, Illinois, chemists work on methods for making plastics, paints, varnishes, and various other products from them.

See "News from the U. S. Regional Soybean Laboratory" on page 2.

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Research Tells Us...

Soybean Oil Traffic Paint Probable

By Dr. R. T. Milner, Director

U. S. Regional Soybean Industrial Products Laboratory, a cooperative organization participated in by the Bureaus of Agricultural Chemistry and Engineering and Plant Industry of the U. S. Department of Agriculture, and the Agricultural Experiment Stations of the North Central States of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

THE Soybean Laboratory is a research organization. It is attempting to find new uses for soybeans and soybean products and to increase the uses that have already been found for these products. In working in this field of new uses, not all experiments can be successful nor can results be achieved quickly. Since the organization of the laboratory, however, many problems have been successfully attacked, and it is the purpose of the present article to describe a recent development which shows great promise.

Huge Quantities Used

The use of paint on roads may not at first seem very important. Consider, however, the many miles of pavement on through highways that have guide stripes down the center. Remember the curves and hills, marked to prohibit one car passing another. Think of the pedestrian lanes, parking flares, and traffic arrows in cities and towns. It is plain that traffic paint is a very important item and that in this day of speedy transportation it is an indispensable aid to traffic control and safety.

What are the chief requirements of a traffic paint? It must be extremely durable to abrasive wear and to the action of the elements. It must be quick drying so that its application does not interfere with traffic. It must retain its color. Of course, these demands on performance require detailed technical specifications. Many of these specifications have specifically required the use of tung oil (china wood oil).

Use Organic Chemical

The price of tung oil is double its former value, and, because of disturbances, there is fear that adequate supplies of this oil may not be obtained at any price. These circumstances led to a careful study of the use of soybean oil in traffic paints. From previous work it was known that soybean oil was extremely durable in ordinary wall paints and varnishes. It was known that some treatment would be necessary to hasten the film-forming properties of soybean oil before it could be used successfully in traffic paints. After many experiments, an organic chemical which acts as an accelerator was discovered. Cooking soy-

bean oil together with this chemical hastens the "bodying" of the oil. Bodying of any oil may be regarded as in some degree the forming of blocks of molecules which will then quickly form a film. The soybean oil after cooking with this accelerator is then combined with a resin or gum to make a varnish type of coating. Pigments, together with thinners, are incorporated in this, and the result is a finished traffic paint. Experiments thus far carried out with soybean oil have indicated that it should be possible to make a good traffic paint with this oil. The laboratory has carried out numerous tests on these soybean oil formulations and is now arranging for the highway division of a midwest state to test the most promising formulation under service conditions. If the tests are successful, another extensive use will have been found for soybean oil.

—sbd—

Iowa Botanist Finds Soybeans Eliminate Creeping Jennie

FIVE consecutive years of soybeans, drilled solid, plus a program of plowing twice a year, will wipe out creeping jennie completely, Dr. A. L. Bakke, Iowa State College research botanist, has found in experiments at the state hospital farm at Cherokee, Iowa.

One of the worst and most widespread perennial weeds, creeping jennie or bindweed, simply died from lack of sunshine when subjected to the dense, smothering vegetation that the soybeans produced.

Bare or Beans

Under the weed-eradication programs as practiced by Dr. Bakke, the ground is kept bare when not growing soybeans. His system is as follows:

The land is plowed in the fall and left undisturbed until spring. Then it is cultivated with a spring tooth harrow. About June 1 the field is plowed again and levelled, cutting off and burying ambitious bindweed shoots under 8 inches of earth.

Beans are drilled immediately and get such a head start that the bindweeds never catch up. By the time the jennie

shoots break through the surface again—a matter of around 3 weeks—the beans are 3 or 4 inches high and already cutting off much of the sunlight.

Shut Out Sun

Growing rapidly, the beans eventually form such a dense cover that scarcely any sunlight filters through. Without sunlight, the bindweeds cannot manufacture food and are forced to draw upon root reserves. Several years of this treatment eventually depletes the reserves and the plants starve to death.

In addition to ridding the fields of creeping jennie, the soybean smother crop can be counted upon to yield a crop of hay. The average yield has been about 2 tons per acre, although this year the yield was even greater. Sometimes the beans are allowed to mature and are threshed for grain.

Must Be Solid

Bakke points out that soybeans must be drilled to produce an effective cover. When planted in rows and cultivated, the soybeans do not completely shut out the sun, and the weeds manage to catch the sunlight that falls between the rows.

Try Other Crops

Areas that were heavily infested in 1936 are now, after 5 years of plowing and soybean cropping, completely free of bindweeds. There has been some soil washing, but these losses have been offset by eradication of a pest which hindered production of profitable crops.

Bakke reports that other crops besides soybeans have been tested at Cherokee, including millet, sudan grass, sorghum and alfalfa, but none of these seems to be quite as effective. Alfalfa will keep bindweed from producing seed.

—sbd—

Canada Permits Duty-Free Imports of Soybean Oil

The Canadian Government issued an order, effective November 16, 1940, providing for the free entry of soybean oil for use in canning fish. This order was originally created on February 12 but was limited to a period that expired July 31, 1940. The new order is to remain in force until further notice.

Official Canadian statistics for 1939 show a considerable increase in soybean oil imports from the United States. While information from the same source is not available for 1940, the United States exports for the months January-October amounted to 1,282,279 pounds or 11 per cent above the calendar year 1939.

SOYBEAN OIL... WHO USES IT?

Current Consumption Lies in Edible Fields

By H. W. Galley, Manager Oils Division, A. E. Staley Mfg. Co., Decatur, Ill.

IT is a far cry from a mountain ledge in China centuries ago, to an American streamlined kitchen in 1940. According to a legend far back in the dim past a caravan laden with gold, silver and valuable furs, while yet several days' journey from their home in Eastern China, were beset by bandits and took refuge in a rocky defile where defense was simplified. Besieged and faced with starvation, a servant pointed out to his master a vine-like plant bearing some sort of legume. Such a plant was unknown, but has since been identified as the soybean. Pounded to a coarse flour, mixed with water, and made into rough cakes, the caravan was supplied with food until help arrived, and—so the legend goes—the soybean became the very staff of life in China from that date forth.

We need not count by centuries because so short a time ago the soybean appeared on no kitchen shelf in any form. Today there is likely to be on that same shelf a can of shortening, a package of margarine, a jar of mayonnaise or salad dressing, or a can of salad oil, in which soybean oil is substantially present. Thus, after groping in the dark during the earlier years of our domestic production, for a suitable outlet for soybean oil, it has finally been placed in its proper sphere—the food industry.

Prompted by Food Value

In previous years, efforts of the processors to increase the consumption of Soybean Oil in industrial channels, met with little success and it failed to register sufficient stride to warrant production expansion. In any field, there are always one or two men with vision and with sufficient courage to venture research for new outlets. Legendary at first and later factual evidence of the food value of soybean oil prompted the pioneer investment of thousands of dollars to discover means of adapting the Soybean Oil to food uses. It was thoroughly believed that the edible field, if properly developed, would afford

an outlet for the oncoming expansion in the growing and processing of soybeans. All honor is due these early investigators who have made our present achievement possible.

Today the progressive manufacturer is alert to the advantages of Soybean Oil from a standpoint of quality, availability and economy. It is far past the experimental state. A few who are still hesitant and are blind to its many uses in the food industry may lack the courage of their leaders in investigating its adaptability to their own technic.

Uses Major Portion

Government records show that perhaps the most significant development in the compounds and vegetable cooking fat field during the past few years has been the rapid increase in the use of Soybean Oil as a manufacturing material. Prior to 1935, when domestic production of Soybean Oil began its recent sharp expansion, only negligible quantities were used in cooking fat. In 1935, 52,000,000 pounds of Soybean Oil were used in shortening; last year, over 200,000,000 pounds, or 55 per cent of the total crop was used in the manufacturing of shortening and compounds. Margarine, mayonnaise, salad dressing, and other edible products, accounted for another 100,000,000 pounds, or more than one-fourth of last year's crop of oil. Paint, varnish, and linoleum took about 28,000,000 pounds, or a very small percentage of the total oil produced. Nineteen-forty is expected to show even greater increases, margarine alone having consumed Soybean Oil so far this year at the rate of 100,000,000 pounds for the first six months of 1940. Compared with older oils of longer experience, Soybean Oil has made the greatest success in the fats and oils field.

Few of us realize our own contribution to its consumption, but a glance at our own kitchen shelf may be a revelation. New outlets in the food industry are being constantly investigated and engi-

neered. Not only research, but education and preachment are necessary to widen our present success.

Competes with Lard

Turning factory production of Soybean Oil into consumption is not as easy as the foregoing might indicate. Let us first consider that in 1939 more than half of the Soybean Oil crop was consumed in shortening manufacture—shortening competes with lard and in 1939 this country had the biggest lard production in the past five years. The loss of export outlets due to European War has thrown a heavy burden on this country to consume its own lard. This has brought about a sharp increase per capita which has recovered to 12.7 lbs. in 1939 as compared with 9.5 lbs. in 1935. Government bulletins indicate that lard consumption in 1940 may reach 15 to 16 lbs. per capita which would be the largest on record. On the contrary, the consumption of shortening and vegetable cooking fats which was 12.4 lbs. per capita in 1936 declined in 1939 to 10.7 lbs. per capita. And again the Government indicates that a further decrease is indicated for 1940. To get a true outlook for the consumption of Soybean Oil, we must not only regard this lard picture but also realize that cottonseed oil is a heavy constituent and a formidable competitor of Soybean Oil in the manufacture of shortening and vegetable cooking fats. This presents a problem in which the three most important fats, lard, cottonseed oil and Soybean Oil, must be regarded relatively. With the possibility of exports curtailed or shut off completely, the United States as a heavy fat producer has a problem.

Fats Are Interchangeable

As a further result of the European conflict, oils and fats which were formerly imported in large volume are now of lesser consequence and must be replaced with fats and oils of domestic production. This seems to be an obvious

(Continued on page 11)

Factory Production and Consumption of Soybean Oil in the United States

Year	Total Factory Production 1,000 lb.	Shortening 1,000 lb.	Oleo- margarine 1,000 lb.	Other Edible Products 1,000 lb.	Soap 1,000 lb.	Drying Oil Industry 1,000 lb.	Miscel- laneous 1,000 lb.
1931		10,869	623		3,816	8,901	2,051
1932	39,445	4,889	3	180	5,571	11,901	1,875
1933	26,533	489	7	460	4,235	14,274	2,626
1934	35,366	2,735	24	509	1,354	13,353	2,109
1935	105,056	52,452	1,740	9,421	2,549	17,871	1,665
1936	225,297	113,897	14,262	21,598	5,023	17,419	3,405
1937	194,411	90,798	31,793	15,530	10,274	17,157	3,038
1938	243,613	143,318	39,885	11,280	10,897	18,847	5,340
1939	369,760	201,559	70,882	32,345	11,177	28,220	9,332

Soybean Flour is one of man's most efficient food sources

This article is a condensation of a publication entitled "Soya Flour," written by J. A. Le Clerc and L. H. Bailey, and published by the Bureau of Agricultural Chemistry and Engineering of the United States Department of Agriculture. To the authors goes all credit for data contained in this story.

WHEN judged by the amount of protein, minerals (especially calcium), vitamins and energy units contained, flour made from soybeans from which the major portion of the oil has been extracted furnishes one of the cheapest sources of foods available to man. It is also an excellent source of vitamin B, a fair source of vitamin G, and contains some vitamin A. The am-

should be regarded with greatest favor. At present prices it is difficult for millions of our population to secure the minimum requisite of calcium, not to mention vitamins and high quality proteins. Soya flour is one of the cheapest known sources of calcium. One hundred grams of soya flour costs about 1/15 as much as it costs in wheat flour and 1/2 as much as it costs in milk.

cent soya flour contained a protein mixture and a sufficient amount of water soluble vitamins to be adequate for normal growth without fortification from outside sources. The protein from such bread was from two to three times as efficient as that from ordinary white bread.

Soya flour is receiving widespread use as a component of diabetic foods. This is due largely to the low starch content, running as low as 1/30 of the carbohydrate content of cereal flours which it will replace in the diet. The high content of lecithin also makes soya flour a particularly valuable food, the phosphorus being an essential constituent of all the vital organs and nervous tissues of the body. Lecithin plays a favorable role in baking because it permits more even distribution of the fat or shortening used.

Large Potential Use

The possible potential use of soya flour in United States is tremendous. Nearly 100 billion pounds of bread are baked each year by commercial bakers. An even larger total amount of bread is baked each year by housewives, railroad and steamboat companies, hotels and institutions. Over 500 million pounds of macaroni are manufactured each year. The biscuit and cracker manufacturers use some 5 million barrels of flour. Another 5 million barrels are used in making a self-rising and pancake flour. Ten million barrels are used in the manufacture of sweet goods. For most all of these products as much as 20 per cent soya flour could be used to advantage. The total potential usability of soya flour on our present population basis is well over 15 million barrels.

Flours Natural Allies

Additional amounts of soya flour can be used in the production of sausage, and in the brewing industry where it is used as a stabilizer. Even further use will be found in the production of soya milk, in soups, and in any number of other food products, some of which are already on the commercial market.

Soya flour contains a greater concentra-

THE COMPOSITION OF AVERAGE SOYA FLOURS OF THE THREE TYPES

	(a) Whole Bean	(b) Expeller	(c) Solvent
Moisture	7.0	7.7	7.0
Fat	21.1	7.3	2.0
Fibre	2.3	3.0	2.8
Protein	41.6	47.5	54.0
Sugars (mostly sucrose)	9.3	11.4	12.0
Other Carbohydrates	14.1	17.3	16.5
Ash	4.6	5.8	5.7
Lime (CaO)	0.28	0.35	0.37
Phosphoric Acid (P ₂ O ₅)	1.21	1.40	1.54
Lecithin	1.10	1.30	

ount of calcium is 20 times greater than that in potatoes, 12 times that found in wheat flour, five times that found in eggs and about two times the amount present in liquid milk. Milk has always been regarded as the calcium-food par excellence.

Flour made from soybeans processed by the solvent method runs as high as 54 per cent protein. That protein is of especially high quality. Less than 2 per cent starch is contained in the average soya flour, whereas starch is the main constituent of cereal flours, in which as much as 60 per cent is found.

Yields 20 Percent Mix

Experiments conducted by the Bureau of Economics of the U. S. Department of Agriculture and by home economics departments of agricultural colleges indicate that well-risen bread can be made with as much as 20 to 25 per cent soya flour mixed with wheat flour. A 20 per cent mix contains 40 per cent more protein and 150 per cent more of the salt-free minerals than are found in white breads.

The decrease in carbohydrates as a result of using 20 per cent soya flour and 80 per cent wheat flour is approximately 17 per cent. The soya flour contains twice as much calcium as is found in wheat flour. The amount of calcium in a 20 per cent soya flour bread is more than 50 per cent greater than in white bread.

As is well known by students of human nutrition, calcium is one of the elements that is most likely to be deficient in the diets of the lower income groups. Hence a small addition of calcium to bread

The use of calcium-containing food such as soya flour likewise improves the acid-base qualities of foods. Studies by Davidson of the Food Research Division of the Bureau of Home Economics show that the excess of base-forming elements over acid-forming elements in 100 grams of soybean meal will neutralize approximately 26 cc. of normal acid. In contrast the excess of acid-forming elements over base-forming elements in 100 grams of wheat flour will neutralize about 7 cc. of normal base. In other words, soya flour gives an appreciable alkaline residue while wheat flour residue is slightly acid.

There are over 20 amino acids which constitute proteins. Today nine of them are regarded essential for the growth and maintenance of the animal organism. Most of those are found in soybean protein. Soya flour protein costs only 6 per cent as much as meat protein and 7 per cent as much as milk protein. At the same time it is more completely digestible than either.

Johns and Fink of the Bureau of Chemistry of U. S. D. A. found in their experiments with rats that soya bread made from 75 per cent wheat flour and 25 per

COMPOSITION OF FLOURS USED IN MAKING BREAD, CAKES, COOKIES, Etc.

	Water	Protein	Fat	Carbo- hydrates	Ash
Patent Flour	12.01	11.69	1.45	74.37	.48
Clear Flour	12.00	13.00	1.50	72.85	.65
Whole Wheat Flour	12.00	12.00	2.00	72.00	2.00
Soya Flour (whole bean)	7.00	41.60	21.10	25.70	4.60
Soya Flour (expeller)	7.70	47.50	7.30	31.70	5.80
Soya Flour (solvent)	7.00	54.00	2.00	31.30	5.70

tion of the essential food elements so necessary for human nutrition than any other one common food. Further, it is practically free from starch, the one element that is found in abundance in the diet of masses of people. The high calcium content of soya flour and the alkaline reaction of the ash are added reasons why soya flour should be classed with the protective foods.

Soya flour and wheat flour are natural allies — not competitors. The use of the two flours together for most purposes will benefit not only the consumer but also the miller, the baker and the farmer. Its use in such products as cakes, cookies, bread and other pastries will result in foods much richer in high quality protein, minerals and vitamins, and thus in bone and muscle building qualities. At the same time they will be low in carbohydrates — a very desirable feature from the standpoint of the average American diet.

Limiting factor in common use of soya flour to date has been the impossibility of securing it in most localities, and the high price commanded by it as a specialty product. It is hoped that in the near future soya flour will be available in family-size packs over the grocery counters of the nation. Then America will be awakened to the true value of soybeans in the human diet.

Offer \$100 Prizes In Soybean Show

The second annual Soybean Show, Conference, and Combine Clinic sponsored by the Van Wert County Seed Improvement Association, the Van Wert Chamber of Commerce and the dealers and processors in the surrounding territory, will be held at Van Wert, Ohio, on January 20 and 21. A total of \$100 in premiums is being offered in the competitive classes. All samples must be in the hands of the committee at the Van Wert Armory on Monday, January 20, before 8:00 p.m. Entries may be received by mail or express prepaid addressed to Soybean Show, c/o L. W. Adam, Secretary, Armory, Van Wert, Ohio. All entries will consist of one peck (15 lbs.) of beans.

One series of classes will be open only to growers of soybeans in Van Wert County and the second series of classes are open to any grower in the United States. Mandarin, Richland, Dunfield, Mingo, Mandell, and Scioto varieties show in individual classes. There is also one class for any other yellow varieties and a class for any variety other than yellow.

There are three classes for edible soybeans. The first consists of the best peck of any variety of edible soybean, and is open to any grower. The second class consists of the best quart of canned edible soybeans and is open only to women residing in Van Wert County. The third class is for the best article of baked goods such as bread, cookies, or cake using not less than one-third soybean flour. This

Study Field Tests at Circleville



Soybean variety tests being studied by visitors at R. E. Rowland farm at Circleville, Ohio.

A Field Day devoted to the study of different phases of soybean production and utilization was held at Circleville, Ohio, on September 10 with approximately 55 interested farmers attending. The official program started at noon with an organized tour through the soybean processing plant of the Ralston Purina Company and then proceeded to the Ray E. Rowland farm for the inspection of field tests on soybeans there. The trip was under the supervision of F. K. Blair, Pickaway County Agricultural Agent. In the field tests at the Rowland farm there were five different varieties of soybeans planted. These included Mandell, Dun-

field, Illini, Richland, and the Mingo. One edible variety, the Aoda, was also included.

The field varieties were planted in three acre plots with each plot split in half. One part of the plot was left unfertilized and the other part was fertilized with 200 pounds per acre of 20 percent super phosphate. An adjoining test field was partially planted in 21 inch rows and the balance seeded solid. Yields on these two methods of planting were to be compared. Results of these field tests will be available in January and will be carried in a future issue of *The Soybean Digest*.

class is also open to only women in Van Wert County.

1940 Crop Forecast Revised Upward

The government crop report as of December 1 gives the United States total production of soybeans for 1940 as 79,837,000 bushels as against a November 1 prediction of 79,198,000 bushels. Increases were shown in Indiana, Iowa (where the increase was one million bushels), Ohio, Missouri and North Carolina, while Illinois showed a decrease from the previous report of slightly more than 2 million bushels.

This upward revision is in direct contrast with predictions that the December 1 report would show a sharp decrease from the November figures. First of the month reports for the past three months follow:

PRODUCTION

	Soybeans for Beans		
	Dec. 1, 1940	Nov. 1, 1940	Oct. 1, 1940
	(1,000 bushels)		
Illinois	35,140	37,230	39,420
Indiana	10,989	10,439	10,439
Iowa	15,026	14,022	13,680
Ohio	8,400	8,381	8,670
Missouri	1,176	1,018	1,067
N. Carolina ...	2,282	2,254	2,422
6 States	73,013	73,344	75,698
U. S.	79,837	79,198	81,541

October Exports At Low Level

Exports of soybeans from the United States during October, the first month of the 1940-41 marketing year, amounted to only 30,000 bushels as compared with slightly more than 2.5 million bushels in the same month last year. This reduction in volume was anticipated, as the heavy exports during the first months of last season went to European markets. Approximately 98 percent of the October shipments were to Canada and the remaining 2 percent to Latin America.

Du Pont Announces New Paint Line

Mill-white paints, reputedly carrying a large percentage of soybean oil as vehicle, and possessing several very desirable characteristics, are being offered on the market by E. I. Du Pont Nemours & Co. Inc. of Wilmington, Delaware.

Four formulas are being offered in this new line of paints. They are Dulux Mill White, Gloss; Dulux Mill White, Eggshell; Dulux High-hiding Mill White; and Dulux Mill White, undercoat.

Advantages claimed for the new line of mill paints are fast-drying properties, ability to stay white over long periods of time under unfavorable conditions, resistance to yellowing, easy cleaning, ease of application with either brush or spray, and consequent savings in painting costs.

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FURTHER development of our domestic markets for our own farm products is a code with which no one will disagree. It has been our contention that the big field of work for the American Soybean Association is in the development and stimulation of new uses and markets within our nation. Toward that end we should be pointing our efforts. Trade barriers between states make a likely place to start. The last annual convention took definite steps when it adopted a resolution to that effect.

Now a new angle develops. Rumor has it that there is a movement afoot in Cuba to increase the duties on soybean oil and other oils which compete with peanut oil. A strong influence in the move, so the story goes, is a representative of an American company growing large acreages of peanuts there.

A slight increase in the duty would exclude soybean oil. Last year Cuba imported over 100 million pounds of fats and oils. A good share of that was American soybean oil. There should be no discrimination between it and lard, with which it competes in Cuban markets. Yet the proposed duties do not apply to lard.

With the United States now making huge loans to Latin American countries it would seem that this is no time to be making trade concessions too. In fact, it would seem an opportune time to be obtaining such concessions — not giving them.

Officials of the American Soybean Association have called this matter to the attention of Hon. Cordell Hull, Secretary of State, and requested that he advise the Cuban government, through diplomatic channels, to weigh carefully the potential dangers of such action. Instead of higher duties, American vegetable oil growers should be granted further concessions in both crude and hydrogenated oils in order to equalize our trade balance with Cuba.

SOYBEAN oil is only one of several domestically produced oils which compete for the same market. Usage is determined by relative price. Cottonseed oil, peanut oil, linseed oil, corn oil and lard all are in direct competition. That which affects one also

affects the others. Discrimination against one favors the others. Favoritism to one places the others at a disadvantage.

For the first time since the World War the American farmer finds himself in the position of producing sufficient fats and oils to supply the domestic market. From the standpoint of national defense this is strategically sound. World War I found us scrambling for fats and oils of all descriptions. Luckily we are not in that position today. We have sufficient fats and oils for all domestic needs. The increased production brings problems of adjustment.

For a year the Surplus Marketing Administration has been making lard available to the families using the food stamp plan of distribution. The hog producers favored this, applied pressure, and were rewarded. Most of us in the lard producing belt have not yet awakened to the fact that in encouraging such measures we were discriminating against the markets for our own soybean oil, and thus our cash soybeans. It is our contention that so long as we have large supplies of both lard and vegetable oils produced in this country the purchaser should be allowed to make his own choice between shortening compounds. We ask no discriminatory rulings against lard, nor against other fats and oils. We do believe the housewife should be the judge of which shortening she is to use.

Awake to that belief, the Institute of Shortening Manufacturers requested the Surplus Marketing Administration to include other shortenings along with lard. The request was refused. Objection seemed to be to the blended compounds of vegetable and animal fats. The manufacturers of the blended product then acquiesced and entered a request that the S.M.A. include under the blue stamp plan a shortening made solely of domestic vegetable oils.

No decision has yet been announced on this proposal. Soybean producers should be interested, for in consent lies a further field for profitable utilization of soybean oil.

Geo. M. Strayer

THE AMERICAN SOYBEAN ASSOCIATION

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DECEMBER NEWS IN A. S. A.

Secretary

Ben Sez . . .

THE most pleasant way I can think of to begin this column is to extend to my old soybean friends the season's warmest greetings. I have in mind, particularly, the fine group of men who envisioned the future possibilities of the soybean way back yonder when that plant was making its first timid advances into the fields of American agriculture and industry; the group who started the American Soybean Association going and kept it moving along during the lean, formative years when farmers, busy with their corn crops, were indifferent and leaders were skeptical.

As I write these lines in the quiet of my own fireside, the faces of these widely scattered friends, with whom I have had the pleasure of working through the years, come before me in cherished memory. Perhaps some day we may institute a Soybean Hall of Fame and to each of them there will be reserved, I am sure, a special niche of honor in commemoration of their contribution to the development of a great American industry. . . .

The Association is deeply gratified over the cordial reception given by the public to the first issue of *The Soybean Digest*. This enterprise represents the long deferred realization of a dream that has been shaping for a long time, in the minds of soybean leaders, to have an effective medium through which the Association could reach both its members and the general soybean public. Our Executive Secretary, to whom was delegated the task of launching this plan, has made a commendable start. Improvement will naturally follow as time goes on, and we hope to make this a service to our members, unsurpassed in any other field of trade journalism.

It should be quite clear that, in order to carry out this enterprise, a large mem-

bership is a financial necessity. Therefore, with each annual membership fee we are including a year's subscription to *The Soybean Digest*. Only a definite and generous response to this unusual offer can insure its continuance in the future. We want and need the support of all those interested in soybeans and they, in turn, need the services offered by the Association.

—J. B. Edmondson, Sec'y-Treas.,
American Soybean Association,
Clayton, Indiana.

—sbd—

Dave Sez . . . "Why a Legislative Committee?"

THE average grower of soybeans, on first thought, may wonder why it is necessary for the soybean grower or processor to worry about the tariff. Perhaps a few lines will explain why it is so vitally interested. It is mainly because of soybean oil's place in the fat and oil industry that brings the soybean in direct competition with the other edible fats and oils of commerce.

Each year there is imported into the United States from one and one-half to two billion pounds of various fats and oils, a great many of which come in direct competition with soybean oil. The very fact that soybean oil is so versatile and is used in so many lines of industry makes it all the more competitive.

Coconut oil from our own territory, the Philippines, is perhaps our greatest competitor and in spite of the fact that processors of fats and oils in the United States must pay three cents processing tax on coconut oil coming in from the Philippines it still has a tendency to depress soybean oil prices.

On the other hand, chemistry and industry have taken this most versatile of all oils and practically forced coconut oil out of oleomargarine, a total of 82,000,000

pounds of soybean oil having gone into margarine last year. The same thing is true with vegetable shortenings where 200,000,000 pounds were used in 1939 and even more in 1940.

So, you see, the soybean grower who also raises hogs and produces milk and butter comes in direct competition with himself. We are fast approaching the place in American agriculture where we must give more thought to foreign trade, and to tariffs and trade barriers between our own states. Before we act on any foreign trade agreements or on our interstate trade barriers all parties concerned should set down together and talk it over. It is of vital importance to both food producers and consumers.

—David G. Wing, Chairman,
Legislative Committee,
American Soybean Ass'n.,
Mechanicsburg, Ohio.

—sbd—

September Mill Crush Rises

Fifty-seven mills in the United States crushed soybeans during the quarter ending September 30, 1940, reporting a crush of 314,120 tons of soybeans and a production of 103,450,872 pounds of oil, according to the Bureau of Census. These figures compare with 233,821 tons of beans crushed and 74,461,357 pounds of oil produced for the corresponding quarter in 1939; 197,872 tons of beans and 62,750,976 pounds of oil in 1938; and 81,569 tons of beans and 24,334,362 pounds of oil in 1937.

Stocks of beans reported by the crushers on September 30, 1940, were 11,801 tons compared with 28,938 tons in 1939, 10,209 tons in 1938, and 8,787 tons in 1937. Stocks of soybean oil reported by the crushers were 18,385,549 pounds on September 30, 1940, compared with 9,068,917 pounds for the same date in 1939, 22,858,222 pounds in 1938, and 4,932,524 pounds in 1937.

FOR Soy-Paints WRITE O'BRIEN



O'Brien chemists, headed by Matt F. Taggart, have perfected and patented new, super-successful treatments for raw soybean oil. O'Brien Soy-Paints not only contain more soybean oil per gallon (45%); they are actually superior in quality to the best linseed oil paints. If you are interested in purchase for use, for resale or for resale under your own label, write the O'Brien Varnish Company, South Bend, Indiana.

Soybeans . . . and People



The use of soybean flour in muffins adds attractiveness as well as tastiness.

For that "Different" Tastiness TRY SOYBEAN FLOUR

MUCH of the soybean flour on the market is made of the whole or hull-free beans. Some of it, however, is made from the bean press cake, after part of the oil has been removed, and there is a very small quantity from which the fat is extracted by means of a chemical solvent. This last type of soybean flour contains much less fat than the other two.

The first two types can be used in the proportion of one-fourth soybean flour to three-fourths wheat flour in standard recipes for yeast bread, muffins, biscuit and other quick breads, pastry, and plain cakes. If more of the soybean flour is used, the other ingredients generally have to be adjusted. The following recipes are typical.

SOYBEAN MUFFINS

- 1 cup sifted soybean flour
- 1 cup white or whole-wheat flour
- 1 teaspoon salt
- 2 tablespoons sugar
- 2 teaspoons baking powder
- $\frac{3}{4}$ cup milk
- 1 egg, beaten
- 1 tablespoon melted fat

Sift the dry ingredients together. Mix the milk and beaten egg, add the melted fat, pour into the dry ingredients, and stir until they are just moistened. Pour into greased muffin pans and bake in a hot oven (425° F.) for 20 to 25 minutes.

SOYBEAN NUT BREAD

- 1 cup sifted soybean flour
- $1\frac{1}{2}$ cups sifted white flour
- 2 tablespoons sugar
- 3 teaspoons baking powder
- 1 teaspoon salt
- $\frac{1}{2}$ teaspoon cinnamon
- 1 cup chopped nuts
- 2 eggs
- 1 cup milk
- 4 tablespoons melted fat

Sift together the dry ingredients and add the nuts. Beat the eggs, add the milk, and the fat, then add to the first mixture. Let the dough stand in a well-greased bread pan for 20 minutes. Bake in a moderate oven (350° F.) about 1 hour.

SOYBEAN FLOUR APPLESAUCE CAKE

- 1 cup fat
- 2 cups sugar
- 2 eggs
- $1\frac{1}{2}$ cups thick applesauce (unsweetened)
- $\frac{1}{2}$ teaspoon nutmeg
- 1 cup soybean flour
- $2\frac{1}{2}$ cups white flour
- 1 teaspoon salt
- $2\frac{1}{2}$ teaspoons baking powder
- $\frac{3}{4}$ teaspoon soda

Cream fat and sugar; add beaten egg and applesauce to which the nutmeg has been added. Stir in the flour with which the remaining ingredients have been sifted. Bake as a shallow loaf or deep layer cake for 40 to 50 minutes in a moderately slow oven (350° F.). Serves 20 to 24 persons.

SOYBEAN FLOUR GRIDDLE CAKES

- $\frac{1}{2}$ cup soybean flour
- $1\frac{1}{2}$ cups white flour
- 2 teaspoons sugar
- 4 teaspoons baking powder
- $\frac{1}{2}$ teaspoon salt
- 2 eggs
- $1\frac{3}{4}$ cups milk
- 2 tablespoons fat

To the sifted dry ingredients, add a mixture of the beaten eggs, milk and melted fat. Bake as small cakes on a hot griddle. Serves 4 to 6 persons.

SOYBEAN FLOUR SPICE CAKE

- $\frac{1}{2}$ cup fat
- $1\frac{1}{2}$ cups sugar
- 2 eggs
- $1\frac{1}{2}$ cups milk
- 1 cup soy flour
- 2 cups white flour
- 4 teaspoons baking powder
- $\frac{1}{2}$ teaspoon salt
- $1\frac{1}{2}$ teaspoons cinnamon
- $\frac{1}{2}$ teaspoon cloves
- 1 teaspoon allspice
- $\frac{1}{2}$ teaspoon mace
- $\frac{1}{4}$ teaspoon nutmeg
- 1 teaspoon lemon flavoring

Cream fat and sugar. Add the beaten egg, then add alternately the milk and the other ingredients sifted together. Bake as a loaf or a deep layer cake in a moderate oven (375° F.) It can be served warm either with or without an icing.

SOYBEAN FLOUR WAFFLES

- $\frac{1}{2}$ cup soybean flour
- $1\frac{1}{2}$ cups soft wheat flour
- 2 teaspoons baking powder
- $\frac{1}{2}$ teaspoon salt
- $\frac{1}{2}$ cup sugar
- 6 tablespoons melted butter
- $\frac{7}{8}$ cup milk
- 2 eggs

Sift dry ingredients together. Add melted fat and milk to form a batter, then add eggs beaten until foamy. Bake on a hot waffle iron.

— s b d —

Soybean Proteins Improved by Cooking

Because of the strikingly high concentration of protein in soybeans in comparison with known legumes, exact knowledge of the effect of various methods of cooking in improving the biological value of this protein is particularly desirable. Work along this line on field varieties of soybeans was begun early by Prof. Mendel and his associates at Yale and many contributions have been made to the subject since then. Two general conclusions came from these experiments: cooking causes a striking improvement in the nutritive value of the proteins of soybeans; and the amount of benefit produced is roughly proportional to the degree and length of heating applied. No exact agreement has been reached among various investigators as to the temperature necessary to produce the maximum protein value in soybeans, but the implication was that prolonged autoclaving or comparable heat treatment is necessary for this.



More Bakeries Add Soybean Wheat Bread

Among the recent additions to the list of bakers and retailers handling soybean bread are The National Tea Company of Chicago, Illinois, and the First National Stores of Somerville, Massachusetts. Both of these companies operate a chain of grocery stores.

The National Tea Company introduced their Soybean Wheat Bread to the Chicago public about December 1. The bread was distributed through approximately 800 stores covering the territory extending throughout Chicago and as far west as Rockford and as far south as Springfield. They first sampled this loaf to their store managers. The response from that sample was so good that they decided

to place the loaf on the market immediately. Public acceptance and sales have exceeded all expectations and comments from housewives have been most complimentary.

The National Tea Company loaf is one developed by their own bakers which uses about 25% of processed, roasted soybeans ground especially for use in the bread. By the use of a roasted soybean they were able to produce a loaf which is distinctive in appearance and outstanding in flavor.

The First National Stores first started producing a soybean bread as one of their weekly varieties. Offered on three different occasions there was a complete sellout each time. This soybean loaf was sold through some 500 stores in and around Boston and they have sold as many as 20,000 loaves each time it was offered.

Advertise Soybean Margarine

Realizing the importance of Soybean Oil as a price factor in the sale of the Beans, Soybean growers and processors alike will welcome the announcement recently made by the John F. Jelke Company of Chicago that Jelke's "Good Luck," All Vegetable Shortening, is now made largely of domestically produced Soybean Oil. The John F. Jelke Company points out that only by expansion of outlets for Soybean Oil can this year's large crop be utilized in a manner which will maintain favorable prices for the beans and keep the market in its present favorable condition. In line with the Company's policy of cooperating with the producers of domestic fats and oils, it opens this new outlet for Soybean Oil.

The Jelke Company is now conducting an advertising campaign in the State of Iowa with ads appearing in twenty newspapers. The "Story of Soybeans" is being "aired" by Ernie Sanders over station WHO on Mondays, Wednesdays and Fridays at 7 a.m. The campaign stresses the use of Soybean Oil in Jelke's new, all purpose shortening and reminds the consumers that the Soybean is one of Iowa's major crops. The advertisements point out that because nutritious Soybean Oil is vital to the improved goodness of fine Vegetable Shortening, a wholly new market is now open for Iowa's great Soybean Industry. Grocers throughout the state are participating by offering special values.

Wanted . . . MILLIONS OF POUNDS OF SOYBEAN OIL

● In the light of expanding Soybean production and curtailed foreign markets, sales of Soybean Oil to Margarine manufacturers must be substantially increased. Today manufacturers of Margarine should be using many millions of pounds of Soybean Oil per year in addition to the 82,333,941 pounds used during the Federal Fiscal year ending June 30th, 1940.

Consumers all over America want to buy Margarine made from Soybean Oil, but in many States they seldom get the chance. Discriminatory State and Federal Taxes hinder the sale of this Soybean Oil product. They deny American farm producers a legitimate market for their oils and fats and milk. These taxes are unfair to the growers of Soybean, corn and peanut oils and animal fats. They should be repealed. For years the Institute of Margarine Manufacturers have fought to have them repealed. Now — with your help — the fight can be won.

Get in touch with your State — your Federal Legislators. Write to them. Urge them to get behind this campaign for repeal of these unfair, un-American Tax Laws.

INSTITUTE OF MARGARINE MANUFACTURERS

NATIONAL PRESS BUILDING • WASHINGTON, D. C.

Wisconsin Uses Soybeans for Silage

Soybeans with corn, sorghum, sudan grass and other forage crops are each year becoming more widely used for silage purposes in Wisconsin, according to Geo. M. Briggs, Professor of Agronomy at the University of Wisconsin. It is recommended that not more than 30 to 40 per cent of the tonnage placed in the silo be soybeans and that there be sufficient moisture in the mix to stimulate good fermentation.

In some cases in Wisconsin during the past year soybeans were used as the sole constituent of silage. In such cases from 60 to 80 pounds of molasses are recommended per ton of silage. The mechanical problem of mixing the molasses with soybeans is gradually being solved with the use of the new silage force pump outfits which transfer the molasses from the barrel into the throat of the cutter pipe.

When mixing soybeans with other crops for silage the entire mixture may be planted in the row, or the different crops can be planted separately and mixed at the ensilage cutter. The latter method is usually recommended. However care must be used in avoiding stratification within the silo. The different crops should be thoroughly mixed together to insure even feeding qualities and best keeping.

Holding Soybeans Generally Profitable

Over a period of years it has generally been profitable to hold soybeans until late winter or spring rather than to sell at harvest time. The following figures, compiled from the tables of the Federal Weather and Crop Bureau, give the average farm prices for soybeans by months for the years 1930-39 inclusive.

Price		Price	
October	83.8c	April	101.2c
November ..	80.8c	May	106.2c
December ..	88.2c	June	103.5c
January	93.3c	July	99.6c
February	95.6c	August	87.1c
March	98.5c	September .	81.1c

The ten year average rise for the period from November to May was 25.4c, or 31 percent. Prices were higher in May than in November in everyone of the last 17 years, except 1930-31 when all prices were hurdling downward.

Edible Soybeans Comparatively New To America

In the *National Seedsman*, September, J. W. Lloyd, of the Department of Horticulture, University of Illinois, writes on the rise of edible soybeans, and what is being done to popularize the new vegetable with consumers. Mr. Lloyd says that, although the field-type soybean was introduced into the U. S. from the Orient a number of years ago, the vegetable-type

was unknown in America until after the exploration trip in China and Japan by Dr. W. J. Morse, which extended from February, 1929, to February, 1931.

Swift Honors O. E. Jones

Signal honor has been conferred upon one of the best known men in the vegetable oil world with the nomination of O. E. Jones, now vice president of Swift & Company, as a candidate for a director of that company. At the same time, one



O. E. Jones, recently nominated for a directorship of Swift & Company, is a familiar figure in the fats and oils industry.

of his associates, Albert F. Hunt, also a vice president, was named for a similar office.

Shareholders will vote on the nominations at the annual meeting of the company Thursday, January 16. The Board of Directors under the new set-up will be increased from nine to eleven.

Mr. Jones entered the company's employ 28 years ago as a clerk. Later he was a salesman and was transferred to the refinery department of which he later became manager. He has had wide experience in the lard, refinery, and oil mill operations of the company, and was elected vice president in 1936. He has jurisdiction over branch house and plant sales, hotel, contract, and institution, canned goods, and soap departments.

Mr. Hunt has been an employee of Swift & Company for 31 years, having begun his service as a salesman. He became a plant manager and later manager of the by-products department, and in 1930 was elected a vice president of the A. C. Lawrence Leather Company, an associated company, becoming president of this company in 1933. He resigned this post in 1936 when he was elected a vice president of Swift & Company. He has charge of plant operations, the construction department, and the research laboratories.

Production Jumps In Wisconsin

Wisconsin growers produced more soybeans for seed purposes this year than ever before, according to Geo. M. Briggs, Professor of Agronomy at the University of Wisconsin. The increase is attributed to the proposed mill at Milwaukee, as well as to the general national trend toward replacement of the other cash grain crops with soybeans.

The unfavorable weather of December I found a large percentage of the beans still standing in the field, with the snow too deep to satisfactorily harvest. Some concern is felt for germination of these beans. If allowed to dry sufficiently before harvesting they will be entirely satisfactory as livestock feed or for milling purposes. The moisture percentage should be watched carefully as beans with too high moisture will spoil very easily with the coming of warm weather.

Ohio Tests Edible Soybeans

From among the 60 varieties of edible soybeans which have been introduced into this country the Ohio Agricultural Experiment Station Department of Horticulture planted and harvested this season more than 20 varieties of selections. Early, medium, and late maturing strains were tested for palatability and consumer acceptance. Home economics authorities cooperated on these tests.

General samples of all selections were quick-frozen to test this method of preserving the characteristic sweet nutty flavor of this new vegetable.

Development Of the Soybean

In *Food Industries*, October, Gordon W. McBride writes on "What's Happening With Soybeans?" The paper sets forth the rapid growth in soybean output, and shows how soybean products are increasing in variety as well as in quantity, thereby affecting all other food industries more and more, regardless of whether their products are fats, carbohydrates or proteins. There are three illustrative tables.

No Scours with Soybean Meal

Wallace's Farmer, September 21, says that tests at the Illinois Experiment Station have disproved an old belief among farmers that soybean oil meal is too laxative for fattening cattle. The experiments indicate that it can be fed rather heavily with good results. Hereford calves getting a basal ration of shelled corn and hay or silage roughage showed no significant scouring, even when twice the usual amount of soybean oil meal was fed. The high digestibility of soybean proteins makes it one of the most valuable of all concentrates, especially in light of the fact that it is produced in the midwest cattle feeding areas.

Who Uses Soybean Oil?

(Continued from page 3)

solution, but while it may be generally regarded that oils and fats of similar character are relatively interchangeable in use, each has its own characteristics and substitution can only be effected through considerable study and technique of handling. Only time will reveal what can be done in this direction. Soybean Oil, considered quite versatile, may be used to replace some of the imported oils in certain formulations, but in some instances such an idea may be only wishful thinking. The chemist must be called upon to meet this situation if we are to gain any advantage in the further consumption of Soybean Oil by such route.

Optimism has been the buoyant note that has prompted the farmer to grow more soybeans and the processor to build more crushing plant and oil refineries. Our success so far in marketing our production of Soybean Oil must not diminish our efforts to strive for further outlets and new uses if the total volume is to grow. The European War has brought new factors into play and competition is keener than heretofore.

New Ford Soybean Plant Opens

Feedstuffs, October 5, says that the new soybean processing mill of the Ford Motor Company at its River Rouge plant has been placed in operation. With a storage capacity of 80,000 bushels of unprocessed beans, the new mill supplements two smaller extraction plants operated in Michigan as village industries. Together, the plants can produce 5,400 gallons of oil and 259,000 pounds of soybean meal daily.

Soybean Oil Futures Market Opens in N. Y.

The *New York Times*, September 4, says that James J. O'Donohoe, president of the New York Produce Exchange, told members of the Exchange that the soybean oil futures market has "wonderful possibilities." Sales in the opening session were 480,000 pounds.

October Bean Exports Are Negligible

Although the total supply of soybeans is smaller this season than last, the quantity available for crushing is expected to equal or exceed that of a year earlier. In the 1939-40 marketing season, 10,949,153 bushels of soybeans were exported, with 67 percent of the total going to the Netherlands, and 30 percent to Scandinavian countries. Canada, the United Kingdom, and other countries took only 3 percent of the total. With most of continental Europe now cut off from American trade, it seems likely that soybean exports in the current marketing year will be negligible. Only 30,000 bushels of

soybeans were exported in October (chiefly to Canada) compared with exports of 2,526,000 bushels in October 1939.

—sbd—

Oil Trading Rules Revised

Changes in several rules for trading in soybean oil meal and soybean oil were adopted by the National Soybean Processors Association at a meeting October 18. Principal changes fixed a maximum moisture for soybean oil meal when shipped at 12.5 percent, set up methods of sampling meal within twenty-four hours of its arrival at destination, and further strengthened the rules on arbitration and contingencies.

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RAT RUIN

Non-poisonous to humans or pets



Why allow rats to destroy poultry and foodstuffs? RAT-RUIN, a red squill product made according to U. S. Department of Agriculture formulas, will eliminate 90% of that loss.

TRIAL BOX . . .

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Enough to Kill 200 Rats

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Also packed in bushel, half bushel, and one-fourth bushel baskets for quantity users. Write for prices.

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» Feed SOYBEAN OILMEAL by preference, thus making a better market for your cash soybeans. . . . Try our CEDAR VALLEY BRAND 41% Protein Old Process Soybean Oilmeal — our prices are always in line. . . . We can give good service on both carlots and trucklots.

SOY BEAN PROCESSING COMPANY
WATERLOO, IOWA

Foreign Countries Conducting Many Soybean Research Problems

ALTHOUGH the successful production of soybeans in countries showing marked increases in acreage during the past few years may be attributed to several factors, such as soil and climatic conditions favorable to the crop and immunity of the plant to serious diseases and insect pests, successful results have been largely due to the development of adapted types through introduction, selection, and hybridization. Soybean breeding programs have been carried on extensively in Germany, Russia, Netherlands Indies, Rumania, Japan, Manchuria, South Africa, Canada, and some of the Balkan countries, and to a lesser extent in Sweden, England, Holland, France, Italy, Poland, Australia, India and the Philippines. Adaptation studies are being conducted with introductions, chiefly varieties from the United States, in all Central and South American countries, Mexico, Cuba, Santo Domingo and Puerto Rico. As an illustration of serious attempts to establish the culture of the soybean, the work of Riede and co-workers in Germany is outstanding. Detailed studies were first made of the temperature, rainfall, and total warmth of various sections of Manchuria. It was concluded from these studies that it was quite possible to grow soybeans in certain zones—those in which a 5-month period of vegetation prevails, a total amount of warmth of 2400° C. is attained from May to September and the precipitation amounts to 300 mm. It was also concluded that the domestic soybean problem was first and foremost a problem of breeding. The following aims of the German plant breeder are rather unique and may be of interest to our own breeders:

1. To develop varieties that will give better and more reliable yields and have higher protein and fat content.
2. Varieties resistant to pests, parasites, viruses, and unfavorable weather conditions.
3. Varieties that are good converters of fertilizers.
4. Varieties requiring as little cultural and harvesting labor as possible.
5. Varieties that permit harvesting and threshing without loss.
6. Varieties having moderate warmth and moisture requirements.
7. Varieties that will develop more rapidly, flower and ripen early.

Special attention is being paid to rapidity of growth, rapid early development, rapid flowering, and rapid ripening. After 15 years of breeding it is stated a number of varieties have been developed which, after a 3-year test, have been awarded the title of "Pedigree Strains." The German agricultural experts advise the growing of soybeans only in those districts which fulfill their requirements,

which may be readily found by means of meteorological and phenological reports and maps.

—sbd—

Soybeans First in Oil Production

Soybeans now rank first among all herbaceous oil-yielding plants grown in the world. Next in order come cotton, peanuts and flax.

World statistics show that in 1936 more than 27,000,000 acres were devoted to the production of soybeans, with a production of 450,000,000 bushels. Practically one-half of the 1936 world acreage was located in China. More recent figures are not available, but acreage in the United States is reputed to have risen faster than in any other country during the past ten years. The 1940 production figures for the United States show slightly over 10,000,000 acres devoted to soybeans. This acreage is found largely in the Midwest or Cornbelt states.

—sbd—

Pennsylvania State Endorses Soybean Oilmeal

Soybean oilmeal is an economical source of protein of good quality for livestock feeding, according to Bulletin 397 of the Pennsylvania State College. This bulletin, entitled "Soybean Oilmeal for Growing Lambs," was published in April of 1940. Sixty-six pairs of lambs were fed in this study to determine the optimum percentage of soybean oilmeal which can be used as a source of protein in a concentrate mixture in combination with different proportions of hay for growing lambs. Feeds used were yellow corn, clover or mixed timothy clover hay, and soybean oilmeal.

The lambs fed a ration of 3 parts of a concentrate mixture composed of 35 per cent soybean oilmeal, 64 per cent yellow corn and 1 per cent sodium chloride (common salt) and 2 parts of clover-timothy hay made the most economical and rapid gains from time of weaning until they reached 70 pounds liveweight. This ration contained 17 per cent protein.

The lambs fed a ration composed of 2 parts of a concentrate mixture of 10 per cent soybean oilmeal, 89 per cent yellow corn and 1 per cent sodium chloride and 3 parts of red clover hay made the most expensive gains. This ration contained only 12 per cent protein.

The low roughage rations were the most economical and produced the most rapid gains.

No detrimental effects were observed in the rations with high percentages of soybean oilmeal.

Market Street

We invite the readers of *The Soybean Digest* to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5c per word per issue.
Minimum insertion \$1.00.

BANSEI and JOGUN edible soybeans for seed or table use. Write for prices, stating use and quantity in which interested. Strayer Seed Farms, Hudson, Iowa.

MUKDEN, KINGWA and RICHLAND soybean seed by bushel or carload. Grown from field-rogued seedstocks. Write for samples and prices. Strayer Seed Farms, Hudson, Iowa.

THE COUPON on the back cover and your check for \$1.50 will entitle you to a membership in the American Soybean Association and to a year's subscription to "The Soybean Digest" if mailed immediately.

HAVE YOU THE VISION to see the immediate merchandising possibilities in BETTER soy foods for human use? Originators of over 30 better tasting, consumer-tested foods from soybeans offer an exceptional opportunity for partnership. Write Box T. S., The Soybean Digest, Hudson, Iowa.

300 BUSHEL WISCONSIN MANCHU No. 3 soybean seed. Approved by state inspection. Write for prices. Pleasant Home Farm, Saukville, Wisconsin.

1940 Soybean Acreage Largest

The estimated 1940 soybean production of 79,837,000 bushels harvested for beans is 12.5 per cent lower than last year's production of 91,272,000 bushels. For the previous three years, each year's production had been markedly above that of the preceding year. The stage was set for this to recur in 1940 as the acreage grown alone for all purposes reached 10,528,000 acres, the first year the acreage grown alone has gone over the 10 million acre mark. But the dry, hot weather in July and early August severely curtailed yields in the important soybean states of Illinois, Indiana and Ohio, and in addition, the earlier intentions to increase the percentage of the acreage to be harvested for beans did not materialize. The final percentage harvested for beans for the 3-state area was the same as in each of the two preceding years.

The lower production this year is due entirely to the low yield per acre, which is 16.1 bushels per acre for the United States compared with the 1939 yield of 20.7 bushels. Even after allowing for the curtailment in the percentage harvested for beans compared with earlier intentions, the estimate of absolute acreage harvested for beans is 4,961,000 acres, which is 12.3 per cent above the acreage harvested last year, and the largest harvested acreage on record.



A Background for Leadership In Central Illinois

Nelson P. Noble has been manager of Swift & Company's Soybean Mill at Champaign, Illinois during the three years since it was built in 1937. His experience is a good deal more extensive than that, however, for he has been active in oil mill operations and management almost continuously since he came to Swift & Company in 1917.

Mr. Noble speaks from a wide acquaintance with producers throughout the area and a thorough knowledge of their problems when he says:

"The farmers of central Illinois have done an alert and progressive job in helping to develop a sound future for soybean production. This is the home of many of the pioneers who were the first to realize the tremendous possibilities for extensive local production of soybeans as a source of oil for edible

purposes. Their perseverance has brought profit not only to themselves but also to industry as a whole—and offers much encouragement for future developments.

"Our mill here at Champaign provides an important local outlet, convenient for the entire Illinois area. We have a ready market for the entire oil output of our plant, which goes to Chicago for the manufacture of shortening, margarine and salad oil. Swift's Soybean Oil Meal, with its high protein content, answers the requirements of the most approved modern methods of livestock feeding.

"My associates and I are glad to have this chance to extend a hearty greeting to all who are interested in soybean production, and to assure a cordial welcome to any who may find time to visit our Champaign plant."



Swift & Company

BUILDING

A New Industry

● The 87,000,000 bushel soybean crop of 1939 didn't just happen. It represented years of study, struggle, and disappointment. Combined in it were the pointed jibes of doubters and the dreams of believers.

Who built the soybean industry? Certainly not glib-tongued promoters. It was built by farmers who had visions of a new cash crop for America . . . by keen government and college research experts with iron wills . . . by business men — grain handlers and processors — who risked fortunes that a new crop might be converted into useful products.

Through all that development one agency has united the many phases of the industry . . . has steadied it . . . held the keel in balance . . . encouraged sound experimentation . . . discounted over-enthusiasm and distortion . . . encouraged sound building of growing, handling, processing, commercial utilization . . . and engineered constructive legislative efforts in state and nation. That agency is the AMERICAN SOYBEAN ASSOCIATION.

Now that agency is entering a new phase of life. The soybean industry has become of age. It is now highly competitive with other American crops. An official mouthpiece — *The Soybean Digest* — has been established.

New problems confront the industry . . . new developments arise daily . . . soybeans rapidly join the list of important human foods . . . legislative protection must be maintained.

Become an active part of America's fastest growing industry — keep abreast of developments — join the AMERICAN SOYBEAN ASSOCIATION and become a subscriber to *The Soybean Digest*. Send in the coupon today.

[CUT HERE]

J. B. Edmondson, Secretary-Treasurer,
American Soybean Association,
Clayton, Indiana.

Enclosed is \$1.50 in [☐ Cash ☐ Check ☐ M. O.] for 1941 membership in the American Soybean Association and a year's subscription to *The Soybean Digest*.

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